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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

December 17, 1999

Ms. Magalie Roman Salas
Secretary
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

RE: **Ex Parte Presentation**
CC Docket 99-68

Dear Ms. Salas:

On December 14, 1999, SBC submitted an analysis by LECG Inc. in the above referenced proceeding. The cover letter attaching that analysis contained two clerical errors. Attached is the corrected copy of that cover letter. Please substitute this corrected version in the record for the version filed on December 14, 1999.

Thank you for your attention in this matter. If you have any questions, feel free to call Anisa Latif at 202-326-3812.

Sincerely,

Anisa Latif
Legal Assistant

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Ms. Magalie Roman Salas
Secretary
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445 12th Street, SW
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RE: Ex Parte Presentation
CC Docket 99-68

Dear Ms. Salas:

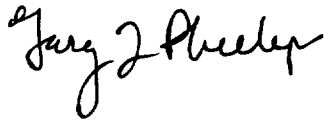
SBC Communications, Inc. respectfully submits the attached analysis by LECG, Inc. responding to a November 30, 1999, written *ex parte* submitted by America Online, Inc. (AOL) in the above-referenced proceeding. In its *ex parte*, AOL responded to a study submitted by Ameritech in its April 12 comments which showed that, even without inter-carrier compensation, and focusing exclusively on end users that have purchased second lines for Internet access, Ameritech does not recover its costs from end user revenues when originating ISP traffic.

In its *ex parte*, AOL claims that Ameritech's study overstates Ameritech's costs. As shown in the attached response, however, AOL's critique is based on a short-run marginal cost analysis that is wholly inconsistent with the TELRIC cost principles that have been adopted by this Commission and state regulators. Indeed, AOL's critique is inconsistent with the positions its authors have themselves espoused in regulatory proceedings. The critique also mischaracterizes Ameritech's cost studies, misquotes Ameritech's testimony in prior rate proceedings, and contains calculation errors.

Of course, as noted, Ameritech's study was limited to end users who have purchased second lines for Internet access, and it attributed *all* revenue from such lines to the origination of Internet traffic. In reality, most Internet consumers contribute no additional revenue when they access the Internet. Most consumers do not purchase a second line for Internet access and most pay flat-rated local rates on their primary line – rates that were set before the explosion of Internet usage. If these users had been considered in Ameritech's study, the disparity between Ameritech's costs and revenues would be even greater than that shown by Ameritech's study.

Since, as Ameritech's study demonstrates, incumbent LECs do not recover their costs in originating Internet traffic, there can be no justification for compounding their losses by requiring them to pay inter-carrier compensation on an ongoing basis for such traffic.

Sincerely,

A handwritten signature in black ink, appearing to read "Gary J. Phillips". The signature is written in a cursive, flowing style.

Gary Phillips
General Attorney

Attachment

**Response to HAI Consulting and Quantitative Solutions'
Critique of Ameritech's Cost Study**

**Debra J. Aron, Ph.D.
William C. Palmer**

LECG, Inc.

December 14, 1999

I. INTRODUCTION

In an *ex parte* filing dated November 30, 1999 in CC Docket No. 99-68, Daniel Kelley and Richard Chandler of HAI Consulting, Inc. and Gus Ankum of Quantitative Solutions, Inc. ("Respondents") respond to an analysis filed in comments by Ameritech on April 12, 1999 in the same docket. Ameritech's analysis shows that Ameritech does not recover its own costs when providing second lines to customers who use them exclusively to access the Internet. Respondents purport to show that Ameritech's analysis is defective and that second lines used for Internet access are, in fact, profitable.

Respondents' critique is flawed because it is based on a short-run cost analysis that is inconsistent with the TELRIC cost principles that have been adopted by federal and state regulators. As the Respondents are fully aware, the TELRIC methodology estimates average long-run costs, not marginal short-run costs. Ameritech relied on previously approved TELRIC estimates because TELRIC reflects existing regulatory requirements. Indeed, Respondent Ankum's previous testimony and HAI Consulting's cost model (the HAI Model, Version 5.1) advocate and incorporate long-run costing methods.

Not only do the Respondents depart from existing regulatory cost standards, but they also mischaracterize Ameritech's cost studies and its testimony in prior rate proceedings. They also commit calculation errors and, although not central to their analysis, misleadingly assert that Ameritech has not accounted for cost "savings" enjoyed when CLECS win ISP customers.

II. SECOND-LINE TELRIC COSTS ARE NOT LOWER THAN FIRST-LINE COSTS

In their "corrected" version of Ameritech's cost study, the Respondents reduce the cost of the second line included in Ameritech's April 12, 1999 analysis by 75%, arguing that the analysis overstates the cost of second lines since "the costs for certain facilities are already included in the costs of the first line."¹ The Respondents' assertion is incorrect. In simple terms, TELRIC is an *average* cost long-run cost methodology. That is, TELRIC calculates unit network access line costs by dividing the total forward-looking cost of all lines (including spare capacity) required at any point in time by the total demand for lines at that same point in time. Because TELRIC is an average cost methodology, there is no distinction between the cost of a second line and the cost of a first line: the TELRIC rate is based on the average cost of all lines.

The second-line loop costs reflected in Ameritech's study were based on these TELRIC principles. Specifically, Ameritech modeled a forward-looking network designed to serve all network access line demand at the lowest overall cost. The model takes into account the fact that some customers will purchase more than one line and designs the network accordingly. The model then divides these costs by the total number of lines in use, including second lines. Respondents ignore the fact that the demand component of a

¹ Kelley, Chandler, and Ankum, "Response to Ameritech's Internet Cost Analysis," *ex parte* presentation before the Federal Communications Commission, CC Docket No. 99-68, November 30, 1999, p. 3.

TELRIC study includes the substantial number of second lines already in use. Thus, second-line usage is already factored into the average per-line cost.

Respondents claim, nevertheless, that Ameritech's true costs of providing service over a second line should be calculated with reference to a short-run cost methodology because the costs of spare capacity are included in the TELRIC cost model. Aside from being inconsistent with regulatory cost principles, this critique is flawed because it assumes that second lines can be perpetually served out of existing spare capacity, without any need in the long-run for maintaining required levels of spare capacity. They cannot. As demand grows, the network must be reinforced with additional used capacity and additional spare capacity. Indeed, even on a short-run basis, Respondents' analysis is flawed because it incorrectly assumes that spare capacity is readily available at all times and in all places. That is simply not the case. For example, we understand that in many areas of California, the demand for additional lines has outstripped SBC's spare capacity and SBC has had to add capacity in its loop plant before processing orders for additional lines.

Ironically, the Respondents' HAI model uses the same long-run costing principles that the Respondents now eschew.² Moreover, just eight months ago, Respondent Ankum himself acknowledged that a short-run marginal cost approach is inconsistent with TELRIC:

"The essence of TSLRIC/TELRIC is that it captures all costs that a firm incurs in the long run in the provision of unbundled network elements. By contrast, short-run marginal costs would consider only the additional costs incurred by a company in providing network elements. For example, the short-run marginal costs of providing unbundled loops to Ameritech would exclude the capital costs for those loops that already exist and consider only the ongoing maintenance expenses of maintaining the loop. Obviously, the short-run marginal cost of providing unbundled loops is, in general, much lower than the TSLRIC/TELRIC costs."³

The above precisely describes the short-run network access line costs that the Respondents have asserted should replace the various state Commission-approved TELRIC estimates used in Ameritech's original April 12, 1999 second line

² Page 36 of The HAI Model, Release 5.1's Inputs Portfolio states that "[b]ecause the model calculates the unit loop investment cost as the total loop investment (including spare capacity), divided by the current loop demand, the resulting unit costs are a conservatively high estimate of the economic cost of meeting current loop demand. This occurs because, in reality, some of the spare distribution plant can and will be used to satisfy additional loop demand in the future, without causing any additional investment cost, thus a larger number of customers will pay for the cable over time." In addition, the output of the HAI model reflects average loop costs. It makes no distinction between first and second lines.

³ Michigan Public Service Commission, *Affidavit of Dr. August Ankum*, Case No. U-11831, April 1, 1999, p. 14.

profitability analysis.⁴ The above also reveals the reason for the substitution. That is, the revised analysis contrived by the respondents is obviously results-driven, and the use of short-run marginal costs that are generally "much lower than the TSLRIC/TELRIC costs" supports the Respondents' desired outcome.

Dr. Ankum has also argued that, as an average cost concept, TELRIC is preferable to the short-run methodology he now purports to embrace:

"The Commission should realize that the TSLRIC/TELRIC methodology sometimes overestimates Ameritech's actual costs (as discussed above) and sometimes it underestimates those actual costs. However, on average, in the long run, TSLRIC/TELRIC captures all efficiently incurred costs better than any other cost methodology. In view of this, it would be inappropriate for the Commission to allow Ameritech to mix TSLRIC/TELRIC and short-run costing methodologies ...

"In short, the [Michigan] Commission should mandate a rigorous adherence to the TSLRIC/TELRIC methodology, consistent with the Commission's own TSLRIC rules and the FCC's Local Competition Order."⁵ (emphasis in original)

In this case, the FCC should disregard the short-run second line cost estimates put forth by the Respondents.

III. THE RESPONDENTS' MODIFICATIONS TO AMERITECH'S SWITCHING COSTS ARE MISLEADING, INACCURATE, AND REPRESENT A SHORT-RUN VIEW OF COSTS

A. *Switching Costs are Usage-Sensitive in the Long Run*

The Respondents argue that Ameritech's analysis is flawed because it assumes that "usage costs increase linearly with usage." Hence, they argue, Ameritech has "greatly overstated" the usage-sensitive costs related to Internet usage. Their argument is based on the fact that there are no usage-sensitive components explicit in the contracts Ameritech has with its switch vendors.

It is correct that Ameritech's current switch-vendor contracts do not explicitly include a usage-sensitive component. Nevertheless, it would be incorrect to infer that Ameritech's true forward-looking cost of providing service is genuinely independent of customers' usage. The prices Ameritech pays for its switches are based on assumptions about the capacity requirements of those switches. For example, vendors will assume that a switch with ten thousand line ports requires a certain amount of capacity, and they will price the

⁴ Kelley, Chandler, and Ankum, "Response to Ameritech's Internet Cost Analysis," *ex parte* presentation before the Federal Communications Commission, CC Docket No. 99-68, November 30, 1999, p. 4.

⁵ Michigan Public Service Commission, *Affidavit of Dr. August Ankum*, Case No. U-11831, April 1, 1999, p. 20-21.

switch accordingly. The fact that the price is quoted on a per-line basis simply reflects the way the costs of the switch are recovered by the vendor; it does not suggest that usage is irrelevant to actual switching costs.

With the explosion of Internet usage, the assumptions that underlie switch vendors' calculations of Ameritech's per-line cost per switch are rapidly becoming outmoded. A switch with 10,000 line ports today must have substantially more processing capacity than was previously necessary. Accordingly, the vendor-quoted cost per line port is likely to be increased to reflect the explosion of Internet usage. We understand that Ameritech is currently in discussions with its switch vendors regarding precisely this issue.

The Respondents inaccurately imply that Ameritech has recognized that the switch is not itself usage-sensitive, citing a quote from Dr. Aron's 1998 testimony in Illinois as support. In citing that passage, however, they neglected to include the entire paragraph from which it was drawn. In that paragraph, Dr. Aron went on to describe how customers whose usage exceeded a standard threshold do induce additional switching costs. As Dr. Aron stated in her testimony,

"[I]f a customer's usage exceeds [a] normal usage level, however, that customer contributes (in a probabilistic sense) to the cost of the additional switching capacity that is rendered necessary. Hence, again consistent with economic cost-causation principles, usage above the normal usage threshold should invoke additional, usage-based charges."⁶

Quite the contrary to Respondents' claims, Dr. Aron's advocacy has consistently recognized that switching costs are indeed usage-sensitive in the long run.

B. The Respondents' "Corrections" to Ameritech's Switching Costs are Conceptually Flawed

To "correct" for the claimed deficiencies of Ameritech's cost estimates, the Respondents provide two "adjusted" cost studies. In the first, they make two adjustments to Ameritech's usage cost. First, they lop off an arbitrary 20% of Ameritech's estimated per-minutes usage cost to account for the alleged fact that "Ameritech has only used lower growth discounts and not higher cutover discounts in its switch cost studies."^{7,8}

⁶ Illinois Commerce Commission, C.C. Docket No. 96-0486/96-0569 (Consol.), *Direct Testimony of Debra J. Aron on Behalf of Ameritech Illinois*, March 24, 1998, p. 7.

⁷ Kelley, Chandler, and Ankum, "Response to Ameritech's Internet Cost Analysis," *ex parte* presentation before the Federal Communications Commission, CC Docket No. 99-68, November 30, 1999, Attachment 1, footnote.

⁸ Ameritech's current vendor contracts provide one per-line price for lines on new, replacement switches (called "cutover" lines), and a different, higher, price for additional lines to existing digital switches (called "growth" lines).

Second, they arbitrarily apply the usage cost to only 3.5 minutes of the call, rather than the entire 26 minutes of the average duration of an ISP call – an “adjustment” which drives their results. Their justification for this modification is their claim that “the End Office usage costs are the same whether the call lasts 3.5 minutes (the average duration for normal calls) or 26 minutes (the average ISP call).”⁹ These assumptions in combination result in a usage cost per 26-minute call that is significantly lower than even the cost estimates produced by their own HAI model.¹⁰

The Respondents’ first claim, that it is appropriate to decrease Ameritech’s estimated cost by 20% because Ameritech does not account for the discount on cutover lines, is based on a faulty premise. In particular, whereas Respondents assume that Ameritech based its analysis on the ARPSM model, which is Ameritech’s new switching cost model that was designed to reflect its per-line vendor contracts, the analysis was, in fact, based on the SCIS model. The reason that Ameritech used the SCIS-based costs is that it was being conservative by using only costs that have already been approved (and adjusted) by the state commissions. The ARPSM model is intended to ultimately replace SCIS. However, ARPSM has not yet been fully vetted or approved by the state commissions. The discount structure that was used by SCIS to produce the numbers in Ameritech’s study is unrelated in any way to the cutover and growth discounts in Ameritech’s current vendor contracts.

In any event, Respondents’ adjustment would be wrong even if Ameritech had used the ARPSM model, because they are incorrect in asserting that Ameritech’s ARPSM model uses only the growth prices and not the cutover discounts. As Dr. Ankum is well aware from his extensive involvement in recent cost proceedings in Illinois and Michigan, Ameritech’s ARPSM model determines costs by calculating a meld of cutover and growth line costs. In other words, contrary to the completely erroneous assertions of the Respondents,¹¹ the model reflects *both* the cutover- and growth-line costs.

Respondents’ second adjustment is to apply their “adjusted” per-minute usage cost figure to a 3.5 minute call, rather than a 26 minute call. Their justification for their completely ad hoc adjustment is that they believe that the end office usage costs on a 26 minute call are the same as the end office usage costs on a 3.5 minute call. There are, however,

⁹ Kelley, Chandler, and Ankum, “Response to Ameritech’s Internet Cost Analysis,” *ex parte* presentation before the Federal Communications Commission, CC Docket No. 99-68, November 30, 1999, Attachment I, footnote.

¹⁰ Although neither Respondents’ analyses nor our corrections to their analyses in our Attachment I explicitly calculate a per-call cost, it is clear that dividing the lower costs yielded by this “non-usage-sensitive” method by ninety calls per month will yield a lower result than dividing the higher costs per month produced by the HAI inputs by ninety calls per month.

¹¹ Kelley, Chandler, and Ankum, “Response to Ameritech’s Internet Cost Analysis,” *ex parte* presentation before the Federal Communications Commission, CC Docket No. 99-68, November 30, 1999, p. 6.

usage costs associated with switching, and Respondents' short-run, marginal cost analysis improperly ignores these costs.¹²

Presumably, this is what Respondents mean when they invoke the claim that costs are non-linear. That is, in a curious application of the concept of "non-linearity," apparently the Respondents believe that non-linearity means that only the minutes constituting "average usage" impose costs, while additional minutes impose no additional costs. As Dr. Aron explains in the Illinois testimony quoted by the Respondents, however, to the extent that costs are non-linear, the non-linearity works in precisely the opposite way. It is the "average" usage on a call that is, in some sense, "included" in the vendor's line price, while the additional usage imposes the costs of early exhaust of capacity. The "non-linear" ULS cost structure that was proposed in Illinois in 1998 (the proceeding from which Respondents quoted Dr. Aron's testimony) had just that structure: some threshold basic usage level was included in the flat line rate, while all *additional* usage was measured. Hence, if the Respondents wanted to reflect the supposed non-linear structure of costs, they should have applied their cost estimate to the 22.5 "additional" minutes of each 26 minute call, not the 3.5 "base" minutes. Doing so would reverse their conclusions; Ameritech would receive negative usage-based profits under this scenario.

In fact, now that the impact of the Internet has become clearer, and the threat of capacity exhaust more immediate, it is more appropriate to view costs as linear. Every minute contributes equally to the exhaust of the network. Hence, every minute of use should bear an appropriate cost.

All functionality on the network that uses capacity contributes to the eventual exhaust of the capacity and therefore hastens the eventual need to augment the capacity. Capacity costing, which is the heart of long-run cost analysis, "spreads" the capital costs of new or existing resources proportionately across all services that use that capacity. It recognizes that *all* traffic contributes proportionately to capacity exhaustion, and that any capacity used for one purpose is not available in the long run for other purposes.

Indeed, Respondents themselves effectively discredit their own analysis by conceding that the notion that there are no incremental usage costs can only be valid from a short-run perspective, and in the long-run incremental costs cannot be zero.¹³

¹² Clearly, the longer the call, the more it contributes to the ultimate exhaust of the capacity of the network. As an analogy, consider children riding a roller coaster at an amusement park. If each child were permitted to stay on the ride for 26 minutes, rather than the (say) 3.5 minute length of one round trip, the waiting time and length of the line to get on the ride would significantly increase. To handle the increased usage, the park would have to add more capacity to the ride (or limit time on the ride, or increase the ticket price to ration demand). The longer each child rides, on average, the more ride capacity the park would need.

¹³ Kelley, Chandler, and Ankum, "Response to Ameritech's Internet Cost Analysis," *ex parte* presentation before the Federal Communications Commission, CC Docket No. 99-68, November 30, 1999, p. 2.

In the Respondents' second adjusted cost model, they replace Ameritech's allegedly erroneous usage cost estimate with usage cost estimates produced by the HAI model. It should be noted, first, that the HAI estimate is a linear estimate. Hence, apparently the authors' own cost model supports a linear assumption for usage costs. Second, even adopting HAI's usage cost estimate, the Respondents' study still results in a profit shortfall for usage in four of Ameritech's five states.

C. The Respondents' "Corrections" to Ameritech's Switching Costs are Computationally Flawed

The calculations employed by the Respondents to illustrate that Ameritech's second lines used for Internet access are poorly documented and, in the case of Respondents' Attachment 2, are completely incorrect. Upon checking the Respondents' calculations, we find that only one of the five per-minute usage-based costs they present in their "corrected" cost analysis in Attachment 2 is mathematically accurate!

First, every "network cost per minute" calculation in both Respondent Attachments 1 and 2 (supposedly calculated from their revised inputs) is clearly incorrect, since in each instance it equals the same number as that in Ameritech's study, although the underlying inputs have been changed.¹⁴

We have attached our corrections to the Respondents' "corrected" analyses as Attachment 1 to this ex parte. In addition, we recalculate Respondents' results from their Attachment 1, which arbitrarily reduce Ameritech's end office per-minute switching costs by 20%. We apply their reduced per-minute rate to the full 26 minutes per Internet call instead of the Respondents' 3.5 minutes. Our Attachment 1 illustrates that, when this artificial reduction in MOUs is removed, even the Respondents' arbitrarily reduced end office switching cost per minute results in revenue shortfalls for the usage-based component.

In Attachment 2 to their ex parte, Respondents purport to calculate Ameritech's usage-based costs, using cost outputs from the HAI Model for per-minute end office switching and per-minute tandem switching. The HAI Model's inputs for end office switching in the Ameritech states are typically between one-third and one-half of the Ameritech values. In contrast, HAI's tandem switching values bear little relationship to Ameritech's values, ranging from slightly lower than Ameritech's costs to approximately five times higher. As before, each network cost-per-minute calculation was incorrectly set equal to the network cost-per-minute using Ameritech's inputs.

In contrast to the Respondents' Attachment 1, however, Respondents' Attachment 2's final Usage Cost numbers are often just plain wrong. For every Ameritech state but

¹⁴ The true numbers underlying the Respondents' Attachment 1 analysis are also poorly documented. It appears that the final "Monthly Usage Cost Per End User for LEC Serving End User" calculation is based on a network cost per minute that assumes that end office switching incurs only 3.5 MOUs, while transport and tandem switching costs are spread over an entire 26-minute Internet call.

Michigan,¹⁵ the Respondents' calculation appears to use the HAI number for end office switching but substitutes the Ameritech number for Tandem Switching (although the attachment lists the HAI number).

As illustrated in Attachment 1 to our ex parte, which corrects Respondents' spreadsheet errors, even the HAI Model's end office and tandem switching inputs result in Ameritech's usage-based costs exceeding its usage-based revenues for typical Internet calls in all states but Illinois.

D. Respondents Incorrectly Assert that Ameritech Has Ignored Certain "Benefits" of Interconnection

The Respondents comment in their conclusions that Ameritech's study ignores "the fact that the ILECs are actually relieved of some costs when CLECs terminate ISP-bound traffic" (p. 8). The Respondents' comments serve to point out the obvious: since Ameritech does not deliver the traffic to a CLEC-served ISP, it clearly does not incur the costs for the functions provided by the CLEC once the CLEC picks up the traffic at its switch. For this reason, Ameritech properly did not include these costs in its analysis. Ameritech's analysis includes only the costs incurred by Ameritech for the functions that it provides when it originates a call and delivers it to a CLEC. Hence, there is no overcounting of costs or any omitted "benefits."

In any event, Respondents ignore the fact that Ameritech also experiences certain cost increases when a CLEC serves an ISP. When Ameritech delivers a call to a CLEC, it must be routed over interoffice facilities, often involving tandem switching; in contrast, some share of calls that Ameritech delivers to its own customers are intra-switch calls and therefore require no end office outgoing trunking, interoffice facilities, or tandem switching.

Finally, Ameritech's analysis is conservative, in that it does not attempt to quantify the costs associated with calls to ISPs originating on a customer's primary line. Calls to the Internet from a primary residential telephone line do not generate additional per-line revenues¹⁶ as do second lines purchased for Internet usage, but cause Ameritech to incur the same usage-based costs. Including these costs in Ameritech's analysis likely would cause the magnitude of Ameritech's profit shortfalls on calls to ISPs to increase.

IV. CONCLUSIONS

The analysis filed by Ameritech on April 12, 1999 is simple, straightforward and conservative. It relies on tariffed rates and the most current estimates of TELRIC costs

¹⁵ In the case of Michigan, the HAI-generated and Ameritech numbers for Tandem Switching are so close as to produce no discernible error in the Respondents' calculation.

¹⁶ This is not strictly true in Illinois, where some residential calls are measured. However, it is still largely true even in Illinois, because Band A local calls are measured on a per-message basis rather than a per-minute basis.

determined in state proceedings. In each state that was analyzed, it shows that when customers purchase a second line for Internet access, the revenues Ameritech receives are less than the costs incurred. The Respondents' criticisms and "adjustments" to Ameritech's cost study in its April 12 ex parte are ill-founded, contrived, and inappropriate. The Respondents have adopted a short-run philosophy in contravention to the methodology advocated by the FCC, the state Commissions, and their own previous advocacy. Their ad hoc assumptions and revisions to Ameritech's cost study are without merit and should be rejected.

Usage-Related Costs vs. Revenues for Ameritech Illinois Providing Service to an End User of an ISP Served by Another LEC

Based on Respondents' Attachment 1: Adjusted Ameritech Switch Costs

	Ameritech Illinois	Respondents' "Corrected" Analysis	Corrected Respondent Analysis	Corrected Respondent Analysis Using Actual ISP Holding Times for Switching
End Office Switching Cost per MOU	\$0.003746	\$0.002997	\$0.002997	\$0.002997
Tandem Switching Cost per MOU	\$0.001072	\$0.001072	\$0.001072	\$0.001072
Transport Termination Cost per MOU	\$0.000201	\$0.000201	\$0.000201	\$0.000201
Transport Minute/Mile Cost per MOU	\$0.000013	\$0.000013	\$0.000013	\$0.000013
Percent Calls Tandem Routed	50%	50%	50%	50%
Average Transport Miles per Call	20	20	20	20
 Network Cost per Minute for LEC Serving End User	 \$0.004844	 \$0.004844	 \$0.004094	 \$0.004094
 Wholesale Discount	 19.40%	 19.40%	 19.40%	 19.40%
 Average Minutes per ISP Call	 26	 3.5	 3.5	 26
Online Hours per Month for End User	39	5.25	5.25	39
(computed) Calls per Month for End User	90	90	90	90
 Monthly Usage Revenues per End User for LEC Serving End User	 \$9.76	 \$9.76	 \$9.76	 \$9.76
 Monthly Usage Cost Per End User for LEC Serving End User	 \$14.06	 \$4.36	 \$4.36	 \$11.89
Revenue Surplus (Shortfall)	(\$4.30)	\$5.40	\$5.40	(\$2.13)

**Usage-Related Costs vs. Revenues for Ameritech Indiana Providing Service
to an End User of an ISP Served by Another LEC**
Based on Respondents' Attachment 1: Adjusted Ameritech Switch Costs

	Ameritech Indiana	Respondents' "Corrected" Analysis	Corrected Respondent Analysis	Corrected Respondent Analysis Using Actual ISP Holding Times for Switching
End Office Switching Cost per MOU	\$0.004097	\$0.003278	\$0.003278	\$0.003278
Tandem Switching Cost per MOU	\$0.000307	\$0.000307	\$0.000307	\$0.000307
Transport Termination Cost per MOU	\$0.000102	\$0.000102	\$0.000102	\$0.000102
Transport Minute/Mile Cost per MOU	\$0.000005	\$0.000005	\$0.000005	\$0.000005
Percent Calls Tandem Routed	50%	50%	50%	50%
Average Transport Miles per Call	20	20	20	20
Network Cost per Minute for LEC Serving End User	\$0.004504	\$0.004504	\$0.003684	\$0.003684
Wholesale Discount	21.46%	21.46%	21.46%	21.46%
Average Minutes per ISP Call	26	3.5	3.5	26
Online Hours per Month for End User	39	5.25	5.25	39
(computed) Calls per Month for End User	90	90	90	90
Monthly Usage Revenues per End User for LEC Serving End User	\$0.00	\$0.00	\$0.00	\$0.00
Monthly Usage Cost Per End User for LEC Serving End User	\$13.42	\$2.53	\$2.53	\$10.98
Revenue Surplus (Shortfall)	(\$13.42)	(\$2.53)	(\$2.53)	(\$10.98)

**Usage-Related Costs vs. Revenues for Ameritech Michigan Providing Service
to an End User of an ISP Served by Another LEC**
Based on Respondents' Attachment 1: Adjusted Ameritech Switch Costs

	Ameritech Michigan	Respondents' "Corrected" Analysis	Corrected Respondent Analysis	Corrected Respondent Analysis Using Actual ISP Holding Times for Switching
End Office Switching Cost per MOU	\$0.004053	\$0.003242	\$0.003242	\$0.003242
Tandem Switching Cost per MOU	\$0.000698	\$0.000698	\$0.000698	\$0.000698
Transport Termination Cost per MOU	\$0.000260	\$0.000260	\$0.000260	\$0.000260
Transport Minute/Mile Cost per MOU	\$0.000006	\$0.000006	\$0.000006	\$0.000006
Percent Calls Tandem Routed	50%	50%	50%	50%
Average Transport Miles per Call	20	20	20	20
Network Cost per Minute for LEC Serving End User	\$0.004912	\$0.004912	\$0.004101	\$0.004101
Wholesale Discount	19.96%	19.96%	19.96%	19.96%
Average Minutes per ISP Call	26	3.5	3.5	26
Online Hours per Month for End User	39	5.25	5.25	39
(computed) Calls per Month for End User	90	90	90	90
Monthly Usage Revenues per End User for LEC Serving End User	\$1.38	\$1.38	\$1.38	\$1.38
Monthly Usage Cost Per End User for LEC Serving End User	\$14.36	\$3.79	\$3.79	\$11.99
Revenue Surplus (Shortfall)	(\$12.98)	(\$2.41)	(\$2.41)	(\$10.61)

**Usage-Related Costs vs. Revenues for Ameritech Ohio Providing Service
to an End User of an ISP Served by Another LEC**
Based on Respondents' Attachment 1: Adjusted Ameritech Switch Costs

	Ameritech Ohio	Respondents' "Corrected" Analysis	Corrected Respondent Analysis	Corrected Respondent Analysis Using Actual ISP Holding Times for Switching
End Office Switching Cost per MOU	\$0.003815	\$0.003052	\$0.003052	\$0.003052
Tandem Switching Cost per MOU	\$0.000660	\$0.000660	\$0.000660	\$0.000660
Transport Termination Cost per MOU	\$0.000155	\$0.000155	\$0.000155	\$0.000155
Transport Minute/Mile Cost per MOU	\$0.000006	\$0.000006	\$0.000006	\$0.000006
Percent Calls Tandem Routed	50%	50%	50%	50%
Average Transport Miles per Call	20	20	20	20
Network Cost per Minute for LEC Serving End User	\$0.004498	\$0.004498	\$0.003735	\$0.003735
Wholesale Discount	20.29%	20.29%	20.29%	20.29%
Average Minutes per ISP Call	26	3.5	3.5	26
Online Hours per Month for End User	39	5.25	5.25	39
(computed) Calls per Month for End User	90	90	90	90
Monthly Usage Revenues per End User for LEC Serving End User	\$1.35	\$1.35	\$1.35	\$1.35
Monthly Usage Cost Per End User for LEC Serving End User	\$13.20	\$3.21	\$3.21	\$10.96
Revenue Surplus (Shortfall)	(\$11.85)	(\$1.86)	(\$1.86)	(\$9.61)

**Usage-Related Costs vs. Revenues for Ameritech Wisconsin Providing Service
to an End User of an ISP Served by Another LEC**
Based on Respondents' Attachment 1: Adjusted Ameritech Switch Costs

	Ameritech Wisconsin	Respondents' "Corrected" Analysis	Corrected Respondent Analysis	Corrected Respondent Analysis Using Actual ISP Holding Times for Switching
End Office Switching Cost per MOU	\$0.004241	\$0.003393	\$0.003393	\$0.003393
Tandem Switching Cost per MOU	\$0.000704	\$0.000704	\$0.000704	\$0.000704
Transport Termination Cost per MOU	\$0.000188	\$0.000188	\$0.000188	\$0.000188
Transport Minute/Mile Cost per MOU	\$0.000014	\$0.000014	\$0.000014	\$0.000014
Percent Calls Tandem Routed	50%	50%	50%	50%
Average Transport Miles per Call	20	20	20	20
Network Cost per Minute for LEC Serving End User	\$0.005155	\$0.005155	\$0.004307	\$0.004307
Wholesale Discount	19.40%	19.40%	19.40%	19.40%
Average Minutes per ISP Call	26	3.5	3.5	26
Online Hours per Month for End User	39	5.25	5.25	39
(computed) Calls per Month for End User	90	90	90	90
Monthly Usage Revenues per End User for LEC Serving End User	\$5.31	\$5.31	\$5.31	\$5.31
Monthly Usage Cost Per End User for LEC Serving End User	\$14.97	\$3.98	\$3.98	\$12.50
Revenue Surplus (Shortfall)	(\$9.66)	\$1.33	\$1.33	(\$7.19)

Usage-Related Costs vs. Revenues for Ameritech Illinois Providing Service to an End User of an ISP Served by Another LEC

Based on Respondents' Attachment 2: Based on HAI Switching Inputs

	Ameritech Illinois	Respondents' "Corrected" Analysis	Corrected Respondent Analysis
End Office Switching Cost per MOU	\$0.003746	\$0.001450	\$0.001450
Tandem Switching Cost per MOU	\$0.001072	\$0.000860	\$0.000860
Transport Termination Cost per MOU	\$0.000201	\$0.000201	\$0.000201
Transport Minute/Mile Cost per MOU	\$0.000013	\$0.000013	\$0.000013
Percent Calls Tandem Routed	50%	50%	50%
Average Transport Miles per Call	20	20	20
Network Cost per Minute for LEC Serving End User	\$0.004844	\$0.004844	\$0.002442
Wholesale Discount	19.40%	19.40%	19.40%
Average Minutes per ISP Call	26	26	26
Online Hours per Month for End User	39	39	39
(computed) Calls per Month for End User	90	90	90
Monthly Usage Revenues per End User for LEC Serving End User	\$9.76	\$9.76	\$9.76
Monthly Usage Cost Per End User for LEC Serving End User	\$14.06	\$7.40	\$7.09
Revenue Surplus (Shortfall)	(\$4.30)	\$2.36	\$2.67

Usage-Related Costs vs. Revenues for Ameritech Indiana Providing Service to an End User of an ISP Served by Another LEC

Based on Respondents' Attachment 2: Based on HAI Switching Inputs

	Ameritech Indiana	Respondents' "Corrected" Analysis	Corrected Respondent Analysis
End Office Switching Cost per MOU	\$0.004097	\$0.001330	\$0.001330
Tandem Switching Cost per MOU	\$0.000307	\$0.001550	\$0.001550
Transport Termination Cost per MOU	\$0.000102	\$0.000102	\$0.000102
Transport Minute/Mile Cost per MOU	\$0.000005	\$0.000005	\$0.000005
Percent Calls Tandem Routed	50%	50%	50%
Average Transport Miles per Call	20	20	20
Network Cost per Minute for LEC Serving End User	\$0.004504	\$0.004504	\$0.002358
Wholesale Discount	21.46%	21.46%	21.46%
Average Minutes per ISP Call	26	26	26
Online Hours per Month for End User	39	39	39
(computed) Calls per Month for End User	90	90	90
Monthly Usage Revenues per End User for LEC Serving End User	\$0.00	\$0.00	\$0.00
Monthly Usage Cost Per End User for LEC Serving End User	\$13.42	\$5.17	\$7.03
Revenue Surplus (Shortfall)	(\$13.42)	(\$5.17)	(\$7.03)

**Usage-Related Costs vs. Revenues for Ameritech Michigan Providing Service
to an End User of an ISP Served by Another LEC**
Based on Respondents' Attachment 2: Based on HAI Switching Inputs

	Ameritech Michigan	Respondents' "Corrected" Analysis	Corrected Respondent Analysis
End Office Switching Cost per MOU	\$0.004053	\$0.001390	\$0.001390
Tandem Switching Cost per MOU	\$0.000698	\$0.000700	\$0.000700
Transport Termination Cost per MOU	\$0.000260	\$0.000260	\$0.000260
Transport Minute/Mile Cost per MOU	\$0.000006	\$0.000006	\$0.000006
Percent Calls Tandem Routed	50%	50%	50%
Average Transport Miles per Call	20	20	20
Network Cost per Minute for LEC Serving End User	\$0.004912	\$0.004912	\$0.002250
Wholesale Discount	19.96%	19.96%	19.96%
Average Minutes per ISP Call	26	26	26
Online Hours per Month for End User	39	39	39
(computed) Calls per Month for End User	90	90	90
Monthly Usage Revenues per End User for LEC Serving End User	\$1.38	\$1.38	\$1.38
Monthly Usage Cost Per End User for LEC Serving End User	\$14.36	\$6.58	\$6.58
Revenue Surplus (Shortfall)	(\$12.98)	(\$5.20)	(\$5.20)

**Usage-Related Costs vs. Revenues for Ameritech Ohio Providing Service
to an End User of an ISP Served by Another LEC**
Based on Respondents' Attachment 2: Based on HAI Switching Inputs

	Ameritech Ohio	Respondents' "Corrected" Analysis	Corrected Respondent Analysis
End Office Switching Cost per MOU	\$0.003815	\$0.001270	\$0.001270
Tandem Switching Cost per MOU	\$0.000660	\$0.001000	\$0.001000
Transport Termination Cost per MOU	\$0.000155	\$0.000155	\$0.000155
Transport Minute/Mile Cost per MOU	\$0.000006	\$0.000006	\$0.000006
Percent Calls Tandem Routed	50%	50%	50%
Average Transport Miles per Call	20	20	20
Network Cost per Minute for LEC Serving End User	\$0.004498	\$0.004498	\$0.002123
Wholesale Discount	20.29%	20.29%	20.29%
Average Minutes per ISP Call	26	26	26
Online Hours per Month for End User	39	39	39
(computed) Calls per Month for End User	90	90	90
Monthly Usage Revenues per End User for LEC Serving End User	\$1.35	\$1.35	\$1.35
Monthly Usage Cost Per End User for LEC Serving End User	\$13.20	\$5.73	\$6.23
Revenue Surplus (Shortfall)	(\$11.85)	(\$4.38)	(\$4.88)

**Usage-Related Costs vs. Revenues for Ameritech Wisconsin Providing Service
to an End User of an ISP Served by Another LEC**
Based on Respondents' Attachment 2: Based on HAI Switching Inputs

	Ameritech Wisconsin	Respondents' "Corrected" Analysis	Corrected Respondent Analysis
End Office Switching Cost per MOU	\$0.004241	\$0.001410	\$0.001410
Tandem Switching Cost per MOU	\$0.000704	\$0.001010	\$0.001010
Transport Termination Cost per MOU	\$0.000188	\$0.000188	\$0.000188
Transport Minute/Mile Cost per MOU	\$0.000014	\$0.000014	\$0.000014
Percent Calls Tandem Routed	50%	50%	50%
Average Transport Miles per Call	20	20	20
Network Cost per Minute for LEC Serving End User	\$0.005155	\$0.005155	\$0.002477
Wholesale Discount	19.40%	19.40%	19.40%
Average Minutes per ISP Call	26	26	26
Online Hours per Month for End User	39	39	39
(computed) Calls per Month for End User	90	90	90
Monthly Usage Revenues per End User for LEC Serving End User	\$5.31	\$5.31	\$5.31
Monthly Usage Cost Per End User for LEC Serving End User	\$14.97	\$6.75	\$7.19
Revenue Surplus (Shortfall)	(\$9.66)	(\$1.44)	(\$1.88)